



The Bulletin 380

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August 2014

Future Events

Wednesday 3 September 2014
1224th Ordinary General Meeting
The Fourth Dimension and Beyond:
The paradox of working in
unimaginable worlds

Delivered by:

Scientia Professor Ian H Sloan AO,
UNSW

Union, University & Schools Club
25 Bent St, Sydney

6:00 for 6:30 pm

Wednesday 1 October 2014
1225th Ordinary General Meeting
Australia's most spectacular
environmental rehabilitation project:
Phillip Island, Pacific Ocean

Delivered by:

Dr Peter Coyne

Union, University & Schools Club
25 Bent St, Sydney

6:00 for 6:30 pm

SOUTHERN HIGHLANDS BRANCH
Thursday 18 September 2014
Bees in the Food Chain, Economy and
Threats

Delivered by:

Dr Madeline Beekman
The Performing Arts Centre,
Chevalier College, Bowral

6:30pm

For more upcoming events see website
www.royalsoc.org.au

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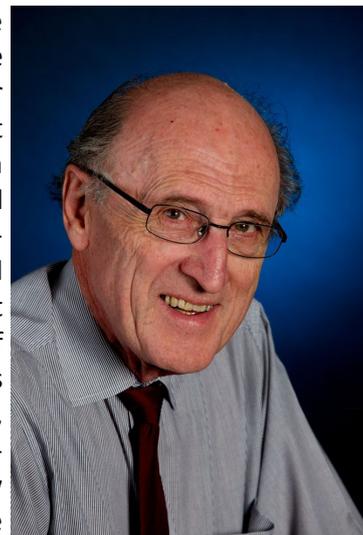
Her Excellency The Honourable Dame
Professor Marie Bashir AD CVO
Governor of NSW

Wednesday 3 September

The Fourth Dimension and Beyond: the paradox of working in unimaginable worlds

Professor Ian H. Sloan AO, UNSW
1224th Ordinary General Meeting
Union, University & Schools Club
25 Bent St, Sydney 6:00 for 6:30 pm

People are fascinated by the idea of the fourth dimension - I will illustrate by the movie "Cube 2 - Hypercube", and other examples from popular culture. That movie is about four dimensions, but can any of us imagine a 10-dimensional hypercube? Yet as a research mathematician I develop, and validate, practical computational schemes for problems that live on hypercubes in maybe hundreds of dimensions. (Where do such problems come from? From the finance industry, from environmental problems of ground-water flows, and many other places.) How is it possible to work in such unimaginable worlds? This non-technical lecture will explore the paradox. The answer lies, of course, in the power of mathematics, to boldly go where imagination fails.



Ian Sloan AO was born in Melbourne, and educated in Ballarat, Victoria. He completed physics and mathematics undergraduate degrees at Melbourne University, an MSc in mathematical physics at Adelaide, and a PhD in theoretical atomic physics at the University of London, finishing in 1964.

After a short period in industry he joined the University of New South Wales in 1965. He was appointed to a Personal Chair in Mathematics in 1983, and appointed a Scientia Professor in 1999. He has held visiting appointments in the USA, United Kingdom, Germany, Hong Kong and Saudi Arabia, but still has UNSW as his academic home.

After a decade of research on few-body collision problems in nuclear physics, his research interests shifted to computational mathematics. Since then he has published extensively in numerical analysis and approximation

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Saving Australia through science education

Emeritus Scienta Professor Eugenie Lumbers AM Dist FRSN

Report of August Meeting 2014



Vice President Em. Prof Brynn Hibebrt and
Emeritus Scienta Professor Eugenie Lumbers AM Dist FRSN

The world is experiencing an exponential rate of technological progress. Change was relatively gradual from the time of the domestication of the horse until the 17th century. Indeed, in the early stages of the Industrial Revolution, industry was still heavily dependent on horse-drawn transport. In 1900, just 14 years after the invention of the motor car, there were still 300,000 horses in service in London. That same year, there were 0.11 cars per thousand people in the US; in 2009 there were 828. This enormous, rapidly accelerating technological change took place as a consequence of science and its application in development of technology. The question is why was there such enthusiasm for science in the 1940s and 1950s but this has largely disappeared today in many countries, not the least of which is Australia. This poses a major challenge for Australia – how will we keep up with technological progress when few people are interested in seeking a science or technological education? Despite the apparent interest in science, in a multitude of TV programmes for example, this is

ranked number three in the world (after South Korea and Japan) in the OECD Programme for International Student Assessment (PISA) test, a test that measures problem-solving capability in 15-year-olds. In the latest test, in 2012, Australia ranks number 8 (after Singapore, South Korea, Japan, China, Hong Kong, Taipei and Canada). It is not surprising that Australia's ranking is slipping when only 51% take a science subject in year 12 and less than 20% studied chemistry or physics. (Interestingly, biology is somewhat higher at 25% because it is seen as being "less academic".) What will the future hold when the technologically-educated people of today are gone? It is extraordinary that 76% of Australians do not see science directly relevant to themselves but important to Australia's future.

The Academy of Science tried to address this through its "Primary Connections" programme an inquiry based programme to help teachers develop their teaching programmes and to provide curriculum resources. Similarly, the Academy's "Science by Doing" programme to secondary

actually positioning science as entertainment, not as true science. Despite this rapid shift away from science, Australia was still doing well by international standards until the late 20th century. In 2000, Australia

schools is aimed at stimulating the all-important interest and enjoyment in science for children in early secondary school so that they go on to choose a career in science.

Professor Lumbers concluded by observing it is extremely important some high profile spokespeople are identified who can agitate for science and make young people aware of the enormously rewarding and enjoyable career that science can offer.

(Continued from page 1)

theory. His prizes and awards include the Information Based Complexity Prize, the Lyle Medal of the Australian Academy of Science, the Szekeres Medal of the Australian Mathematical Society, and the ANZIAM Medal of Australian and New Zealand Industrial and Applied Mathematics.

He has served as President of the Australian Mathematical Society, and for a number of years chaired the National Committee for Mathematics. From 2003 to 2007 he was President of the International Council for Industrial and Applied Mathematics. He currently serves on the editorial boards of many international journals, and is a Senior Editor of the Journal of Complexity.

He is a Fellow of the US-based Society of Industrial and Applied mathematics, and a Fellow of the American Mathematical Society. He was elected a Fellow of the Australian Academy of Science in 1983, and a Fellow of the Royal Society of New South Wales in 2014. In 2009 he was appointed an Officer of the Order of Australia (AO).

Southern Highlands Branch

Extracting Sunbeams out of Cucumbers: the Royal Society and Swift's Gulliver's Travels

Emeritus Professor Clive Probyn
Report of June Meeting 2014

Modern science arose from some very murky backgrounds and some very strange projects. In the 17th century, it was difficult to separate the winners from the losers, the inspired from the lunatic. The Royal Society of London (1660) was to transform our ways of seeing and knowing things, but to do that it had to first fight its own battles against ignorance, fear and prejudice.

Professor Probyn spoke of how projects to fix the date of the Universal Flood and bizarre proposals to fix the longitude went alongside astonishing discoveries in microscopy, astronomy, cell biology, mathematics, geography and comparative anthropology. He described how one man in particular turned his literary genius onto the New Science, his troubled response becoming the great classic Gulliver's Travels. Probyn's illustrated talk examined both the science and the satire, and proposed that questions put by Jonathan Swift in 1726 are still being put today.

The Society's founder and patron was Charles II, who immediately declared himself a Fellow of it. The Royal Society of London was founded in 1660 and incorporated in 1662; the Great Plague ravaged the nation's capital in 1665; the great Fire of London destroyed about two thirds of the city's buildings, but took only 5 lives, in 1666. Just one year later appeared the History of the Royal Society of London, only seven years after its inception. Probyn suggested that this was surely a response to the New Science's phenomenally rapid rise in England,

and an attempt to account for its national and international cultural significance.

Before 1660, there was no concept of 'science' as we would recognize it, that is, as a special sort of intellectual discipline or method. There was as yet no group of people who would identify themselves as scientists. Probyn is of the view that when research finally began to coalesce around a particular group of like-minded men, it was not surprising that a merchant's private house in Bishopsgate Street was chosen for their activities, not a university college. It became known as Gresham College, and the Royal Society met there from 1660 to 1710, where a room and an 'laboratory' were provided for those who were 'elaborated' in the fields of physics, music divinity, rhetoric, astronomy and law.

In Probyn's wide ranging and fascinating illustrated lecture, case histories of numerous early scientists were given. One of them was Isaac Newton who spent most of his life attempting to 'prove' the truth of the Biblical version of human history by his work in geology and archaeology. Probyn stated that Newton's work owed as much to medieval number mysticism as to modern mathematics. Bishops were men of science, and scientists wrote books on theology – this was the norm. Specialization among the scientists was neither necessary nor common. Newton became president of the Royal Society in 1703, having been employed analyzing and weighing the coinage since 1696 in his role of



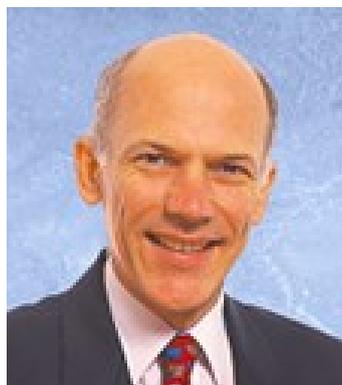
Master of the Royal Mint. Newton never lost his interest in theology.

Much of Probyn's commentary focused on the year 1727, because so many notable events occurred then. It was the year that Sir Isaac Newton died, the year Gulliver was published in its corrected edition, the year that Charles II died, the year that Jonathan Swift reached 60, and the year that J.S.Bach wrote his sacred oratorios in Leipzig.

A summary such as this can barely do justice to Professor Clive Probyn's presentation. It was clear however from the questions that members of the 96 person audience asked of him that they had enjoyed the lecture very much and had been challenged by it.

Anne Wood

From the President



After a lengthy investigation and tender process, the Council unanimously agreed to appoint The Association Specialists (TAS) to provide all back-office services for the Society.

It is expected that this transition will take place progressively and will be completed by 30 September. Over the next few weeks, the Council will send you further details to advise you of the new arrangements as this transition takes place. This will include changes to postal address, telephone number (which will now be manned during normal business hours, five days per week) and a number of other improvements to the administration systems of the Society.

As I mentioned in The Bulletin last month, nominations are now open for the Society's 2014 awards. Please give this some consideration and nominate people you think would be worthy recipients.

The next several months are busy – the Clarke and Liversidge lectures will be delivered and the Royal Society of NSW Scholarships for 2014 will be judged. Some of the final details have not yet been determined – these will be posted to the website as soon as they are finalised. The Jak Kelly award presentation is expected to take place

at our December meeting prior to the Christmas party.

If there are any issues you would like to raise with me, I am easily contacted by e-mail at president@royalsoc.org.au and would like to hear from you.

Donald Hector

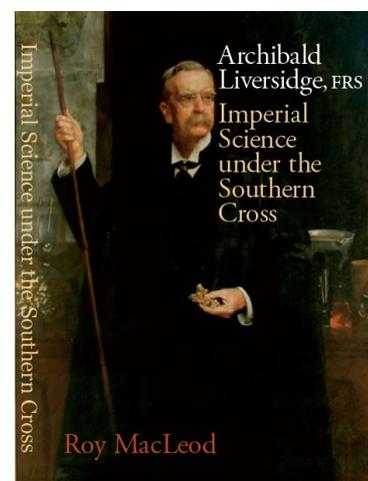
For some time, the Council has been concerned that the office services offered to members has been very limited and the resources available, such as online payment facilities, online database management (so that members can update their own details online) do not meet the minimum expectations that are generally available from organisations like ours. This has been despite the hard work done by our Executive Officer, Emma Dallas.

The reality is that a single person, working just 20 hours per week cannot provide the level of service that our members have every right to expect. For several months, the Council has been investigating what other options there might be and has concluded that the most cost-effective way forward is for the Society to out-source these services to a contract office-service provider.

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